

Claims

1. A method of conducting motion correction for a tomographic scanner including a detector array for detecting radiation to generate detector data, wherein the method comprises:

5 storing detector data collected during a data acquisition period, said detector data being indicative of:

i) directions along which radiation is detected; and

ii) quantities of radiation detected in different of said directions;

10 storing movement data representing movement of the subject during the data acquisition period; and

motion correcting said detector data using said movement data and a motion correction algorithm to calculate motion corrected detector data,

wherein said motion correcting step comprises processing said detector 15 data by:

a) realigning directions of at least some of said detector data on the basis of said movement data; and

b) altering quantities of at least some of said detector data on the basis of said movement data,

20 such that at least some of said detector data are both realigned and altered in quantity,

wherein said altering quantities step comprises calculating estimates of first detector data based on second, different, detector data.

25 2. A method according to claim 1, wherein said estimates are calculated using forward projection from said second detector data.

3. A method according to claim 1 or 2, wherein said altering quantities step also comprises rescaling quantities.

4. A method according to claim 3, wherein the method comprises altering a quantity to take into account both a said calculated estimate and a said rescaled quantity.

5 5. A method according to claim 3, wherein the method comprises selectively utilising a said calculated estimate or a said rescaled quantity to generate a said altered quantity.

10 6. A method according to claim 5, wherein said selection is performed on the basis of a threshold.

7. A method according to claim 6, wherein said threshold is variable.

15 8. A method according to claim 6 or 7, wherein a value indicating an amount of scaling deemed appropriate for a quantity is determined, and the value is compared to the threshold in order to determine whether to scale the quantity upwards or to replace it with a calculated estimate.

20 9. A method according to any preceding claim, further comprising performing image reconstruction using said motion corrected detector data.

25 10. A method according to claim 9, comprising performing image reconstruction using an analytic image reconstruction algorithm and/or an analytic rebinning algorithm.

11. A method according to claim 10, wherein said algorithm is one of 3DRP, FAVOR, BPF, FORE, FORE-X and FORE-J.

30 12. A method according to any preceding claim, wherein said scanner is a positron emission tomography (PET) scanner.

13. A method according to claim 12, wherein said detector data is 3D PET detector data.

14. Computer software for conducting motion correction for a  
5 tomographic scanner including a detector array for detecting radiation to generate detector data, wherein the software is adapted to:

store detector data collected during a data acquisition period, said detector data being indicative of:

- 10 i) directions along which radiation is detected; and  
ii) quantities of radiation detected in different of said directions;

store movement data representing movement of the subject during the data acquisition period; and

motion correct said detector data using said movement data and a motion correction algorithm to calculate motion corrected detector data,

15 wherein said motion correcting step comprises processing said detector data by:

- 20 a) realigning directions of at least some of said detector data on the basis of said movement data; and  
b) altering quantities of at least some of said detector data on the basis of said movement data,

such that at least some of said detector data are both realigned and altered in quantity,

wherein said altering quantities step comprises calculating estimates of first detector data based on second, different, detector data.

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15. A data carrier comprising computer software according claim 14.

16. A tomographic scanner system including a detector array for detecting radiation to generate detector data, wherein the scanner system is  
30 adapted to:

store detector data collected during a data acquisition period, said detector data being indicative of:

- i) directions along which radiation is detected; and
  - ii) quantities of radiation detected in different of said directions;
- store movement data representing movement of the subject during the data acquisition period; and
- 5 motion correct said detector data using said movement data and a motion correction algorithm to calculate motion corrected detector data,  
wherein said motion correcting step comprises processing said detector data by:
- 10 a) realigning directions of at least some of said detector data on the basis of said movement data; and
- b) altering quantities of at least some of said detector data on the basis of said movement data,  
such that at least some of said detector data are both realigned and altered in quantity,
- 15 wherein said altering quantities step comprises calculating estimates of first detector data based on second, different, detector data.